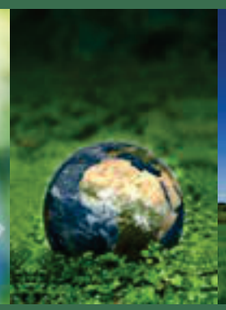
Lanner

Edge AI Appliances

Accelerating AI-driven Edge Computing for Smart City and Critical Infrastructures




Volume 22.1



Unleashing the Power of Edge AI

In today’s rapidly evolving technological landscape, organizations across various industries are increasingly seeking innovative solutions to unlock the power of artificial intelligence (AI) and enhance their operational efficiency. Lanner Electronics has harnessed the potential of Edge AI to develop a range of sophisticated appliances that bring advanced computer vision capabilities to the edge of the network. These appliances are purpose-built to handle the demanding requirements of real-time video analysis and inference, enabling businesses to process data locally and derive actionable insights without relying on cloud connectivity.

In the retail industry, Lanner’s Edge AI appliances enable retailers to gain a deep understanding of customer behavior, analyze foot traffic patterns, and personalize shopping experiences. In the manufacturing sector, Lanner’s Edge AI appliances play a pivotal role in detecting anomalies and defects. Similarly, in the transportation industry, Lanner’s Edge AI appliances can identify license plates for efficient toll collection and vehicle management, optimize traffic flow, and ensure the safety of passengers and pedestrians.

By bringing AI capabilities to the edge of the network, Lanner Edge AI appliances empower organizations with real-time insights, enabling them to make proactive decisions and stay ahead in the dynamic and competitive landscape of today’s industries.

Jeans Tseng
CTO

Edge AI Appliances Solution Overview

Integrated with AI hardware accelerators and pre-validated with AI solution partner, Lanner industrial-grade Edge AI platforms enable Smart City solutions with specific requirements for low-latency, high-throughput, and/or power efficiency in reliable and mission-critical applications. AI-accelerated Edge computing appliances, including deep learning inference servers, computers, acceleration modules and AI starter kit, can build the smart city infrastructures efficiently and economically.

TRANSPORTATION

- Simultaneous Localizationand Mapping (SLAM)
- AMR/AGV
- Adaptive traffic control
- ADAS

MANUFACTURIING

- MV Library & System SW
- MV Lighting
- Video Cards & CVS
- Data Ingestion & Analytics

SMART CITY

- Smart Locks & access control
- Vehicle Tracking
- ALPR
- video content analysis

RETAIL

- Markdown Optimization
- Customer Service Routing
- Promo prioritization
- Ad Targeting

Rugged Edge AI Appliances

Rugged edge AI appliances are designed for mission-erit ical applications in challenging conditions, such as retail video analytics, factory machine vision and traffic mon itoring.

Edge AI Starter Kits

AI Starter Kit aims to deliver an all-in-one platform com posed of AI-accelerated hardware and application-tai lored software to accelerate AI deployment at the in dustrial edge.

Edge AI Servers

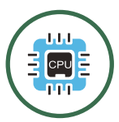
Integrated with Intel Xeon CPU, massive storage and PCI-E expansion for GPU cards, these highperfor mance AI servers are designed for the most sophisticat ed parallel processing.

AI Acceleration Cards

Modular AI acceleration cards features onboard Intel, Hailo and NVIDIA GPU to optimize high volume video delivery and accelerate AI-based video data analyt ics at the edge.

Rugged Edge AI Appliances

Lanner provides a full range of rugged edge AI appliances designed for mission-critical applications, such as vision analytics, machine vision and traffic monitoring. With unique ruggedized design required for different industry, Lanner deep learning inference AI platforms features AI-optimized processing, wide operating temperature, LTE/5G connectivity and rich I/O interface.



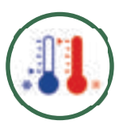
High-Performance Processor

Compact Design

Rich IO Connection

M.2 Expansion

AI Acceleration



Wide Operating Temperature

Fanless Design

5G/LTE Ready

Rugged Edge AI Computer

	NVIDIA Jetson NX	NVIDIA Jetson Orin
Model Name	EAI-i130	EAI-i131 (NEW)
Processor System	NVIDIA® Jetson Xavier NX/Jetson Nano	NVIDIA® Jetson Orin NX/Nano
AI Acceleration Support	NVIDIA Volta GPU	NVIDIA CUDA GPU
Fanless	YES	YES
Memory	16GB	16GB
Storage	1x M.2 2280 M Key, 16GB eMMC 5.1, SD Card	1x M.2 2280 M Key (PCIe x4)
Ethernet	2x RJ45 for PoE+	2x RJ45 for PoE+
I/O	2x COM, Audio, 2x USB 2.0 1x HDMI, 4x DIO	2x COM, Audio, 2x USB 2.0 1x HDMI, 4x DIO
Expansion	M.2: 1x B-Key for 5G, 1x EKey for WiFi-6	M.2: 1x B-Key for 5G, 1x EKey for WiFi-6
Power	+24VDC	+24VDC
Mechanical	201 x 65 x 196 mm	201 x 65 x 196 mm
Environment	-20C~75ºC	-20C~75ºC
Driver Support	Linux Open Source On NVIDIA SDK	Linux Open Source On NVIDIA SDK
Certification	CE/FCC Class A	CE/FCC Class A

Rugged Edge AI Computer

	11th Gen. Intel Core	11th Gen. Intel Core
Model Name	IIoT-i530	IIoT-i531 (NEW)
Processor System	11th Gen Intel® Core i7-1185GRE (Tiger Lake)	11th Gen Intel® Core i7-1185GRE (Tiger Lake)
AI Acceleration Support	N/A	N/A
Fanless	YES	YES
Memory	64GB	64GB
Storage	1x mSATA, 1x SATA	1x mSATA, 1x SATA
Ethernet	2x 2.5G RJ45, 6x RJ45 for PoE+	6x 2.5Gbps RJ45 (4x RJ45 For PoE+)
I/O	2x COM, 8xDI, 4xDO, 4x USB 3.0	4x COM, 4xDIO, 4x USB 3.0
Expansion	M.2: 1x B-Key for 5G, 1x E Key for WiFi-6 1x M-Key For PCIe Gen4	1x PCIe 3.0 x1 FHHL 1x B-Key w/ 2x Nano-SIM For 5G 1x E-Key 2230 For WiFi-6
Power	+24VDC	+24VDC
Mechanical	270 x 76 x 180 mm	270 x 76 x 220 mm
Environment	-40°C~55°C	-40°C~75°C
Driver Support	Windows 10 IoT, Linux	Windows 10 IoT Linux Dabian 11 Pre-install
Certification	CE/FCC, Class A	CE/FCC, Class A / UL

Rugged Edge AI Computer

	Factory Edge AI	Vehicle Edge AI	Railway Edge AI
Model Name	EAI-i730	EAI-V330 (NEW)	EAI-R530 (NEW)
Processor System	Intel® Core i9/i7 (Alder Lake S)	Intel® Atom® x6000 Series	13th Gen Intel® Intel Core i
AI Acceleration Support	N/A	N/A	1x Hailo-8™ onboard
Fanless	YES	YES	YES
Memory	128GB	16GB	64GB
Storage	4x 2.5” SSD	eMMC 128GB (up to 128GB), SATA x1 (removable 2.5” storage bay)	2x SATA3 for 1x Removable Storage Caddy
Ethernet	2x 2.5GbE RJ45	2x 2.5GbE RJ45, 4x GbE PoE	4x 2.5GbE RJ45, 2x GbE PoE
I/O	2x COM, 8x USB 3.2, 4x DIO	4x USB, 2x COM, 1x CAN Bus 4xDI, 2xDO, HDMI, DVI	3x USB, 2x HDMI,
Expansion	1x M.2(NVMe) 2280 M-Key 2x SATA M.2 M-KEY 2242 2x PCIe*16, 2x PCIe*4	1x M.2 304(5)2 B Key socket 1x M.2 2230 E key socket 1x PGN Caddy for LTE/5G	2x M.2 2242/2280 M key (PCIe x4) socket, 1x M.2 2230 E key socket for WiFi, 4x PGN Caddy for LTE/5G
Power	100~230 Vac	12~24Vac	12~24Vac
Mechanical	374 x 250 x 419 mm	TBD	TBD
Environment	-25ºC~65ºC	-40ºC~70ºC	-40ºC~70ºC
Driver Support	Linux Kernel 5.x, Ubuntu Win 10	Linux Debian 10 pre-installed Win 10/11 IoT	Linux Debian 10 pre-installed Win 11 IoT
	CE/FCC Class A, UKCA, UL, CB, RoHS	CE/FCC Class A, E13, MIL-STD-810G	CE/FCC Class A, E13, MIL-STD-810G, EN50155, EN45545-2

Edge AI Starter Kits

Lanner Edge AI Starter Kit aims to deliver an all-in-one platform composed of AI-accelerated hardware and application-tailored software to accelerate time-to-market AI deployment at the industrial edge, such as vision inspection, predictive maintenance and operator monitoring.

NVIDIA

Designed and built in-house by Lanner for secure remote operation and accelerated workloads with the NVIDIA GPU, Lanner Edge AI appliance is validated and edge-ready out-of-the-box for streamlined NGC deployments. NVIDIA GPU CLOUD (NGC) fast-tracks edge AI solutions with its comprehensive catalog of containerized software GPU-optimized for edge-to-core solutions.

Intel

Intel® Edge Insights for Industrial is an open and modular product validated software that aggregates and processes time series, image/video data at the edge to provide useful insights via edge analytics. Powered by the Intel® Distribution of OpenVINO™ toolkit, EIS accelerates development, enabling quick integrations of pre-trained models (e.g., Tensorflow, Caffe, etc.) for object recognition, classification, and facial recognition in vision-based solutions

Hailo

The Hailo-8™ AI processor, featuring up to 26 tera-operations per second (TOPS), significantly outperforms all other edge processors. Its area and power efficiency are leaps and bounds ahead of other leading solutions by a considerable order of magnitude (up to 3 TOPS/W).

Edge AI Starter Kit

	NVIDIA A2	Falcon H8	Intel Movidus
Model Name	LEC-2290H	LEC-2290E	LEC-2290 C/D
Processor System	Intel® Core™ i7-8700 (Codenamed Coffee Lake S)	Intel® Core™ i7-8700 (Codenamed Coffee Lake S)	Intel® Core™ i7-8700 (Codenamed Coffee Lake S)
AI Acceleration Support	NVIDIA A2	Falcon-H8	Intel® Movidius™ Myriad™ X
Fanless	N/A	N/A	N/A
Memory	32GB	32GB	32GB
Storage	2x Swappable SATA III Drive	2x Swappable SATA III Drive	2x Swappable SATA III Drive
Ethernet	2x RJ45, 4x PoE	2x RJ45, 4x PoE	2x RJ45, 4x PoE
I/O	6x COM, 8x DIO, 4x USB 3.0	6x COM, 8x DIO, 4x USB 3.0	6x COM, 8x DIO, 4x USB 3.0
Expansion	1x PCIe*16, 1x Mini-PCIe, 1x B Key M.2	1x PCIe*16, 1x Mini-PCIe, 1x B Key M.2	1x PCIe*16, 1x Mini-PCIe,
Power	9~30 VDC	9~30 VDC	9~30 VDC
Mechanical	275 x 115 x 225 mm	275 x 115 x 225 mm	275 x 115 x 225 mm
Environment	0°C~40°C	-20°C~45°C	0°C~40°C
Driver Support	Windows 10 IoT, Linux	Windows 10 IoT, Linux	Windows 10 IoT, Linux
Certification	CE/FCC, Class A	CE/FCC, Class A	CE/FCC, Class A

Edge AI Starter Kit

	Hailo-8 AI Accelerator	Hailo-8 AI Accelerator
Model Name	IIoT-I530H	LEC-7242H
Processor System	11th Gen Intel® Core i7-1185GRE (Tiger Lake)	Intel Celeron N3350 (Apollo Lake)
AI Acceleration Support	Hailo-8 AI Accelerator	Hailo-8 AI Accelerator
Fanless	YES	YES
Memory	64GB	4GB
Storage	1x mSATA, 1x SATA, 1x M.2	Onboard 64GB eMMC 1x SATA (Design Reserved)
Ethernet	2x 2.5G RJ45, 6x RJ45 for PoE+	2x RJ45
I/O	2x COM, 8xDI, 4xDO, 4x USB 3.0	2x USB 3.0, 1x COM,1x DP, 1x HDMI
Expansion	M.2: 1x B-Key for 5G, 1x E Key for WiFi-6 1x M-Key For PCIe Gen4	1x M.2 B+M Key, 1x Mini PCIe
Power	+24VDC	+12VDC
Mechanical	270 x 76 x 180 mm	168 x 40 x 145 mm
Environment	-40°C~55°C	-20C~70°C
Driver Support	Windows 10 IoT, Linux	Windows 10 IoT, Linux
Certification	CE/FCC Class A	CE/FCC, Class A, UL

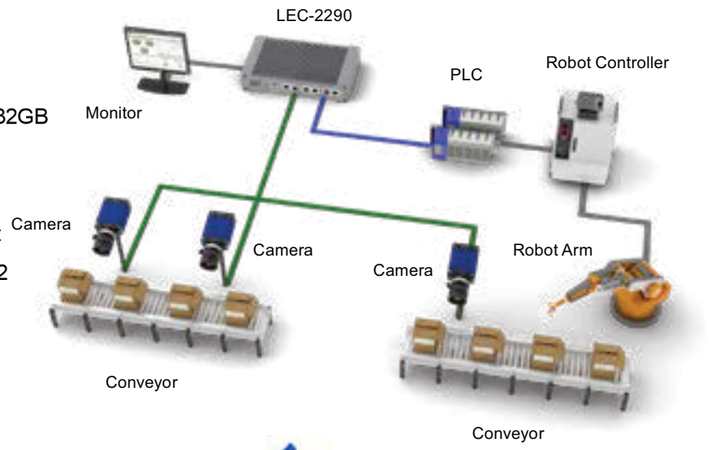
Edge AI Bundled Solutions

Visual Quality Assurance

Lanner collaborate with Rexroth and 36ZERO Vision to build the visual quality assurance system capable of processing AI workloads on edge and allowing machine vision in the factory. Pre-validated with Rexroth's ctrlX Automation OS and 36ZERO Vision's Visual Quality Assurance Software, the Lanner Edge AI computer LEC-2290H automates vision-guided applications in the assembly line, such as automatic documentation, missing parts detection, fault inspection and color verification.

LEC-2290H

- Pre-installed Falcon-H8 AI Accelerator
- Intel® Core™ i7-8700T/i7-8700
- 2x DDR4 2133/2400 SO-DIMM, Max. 32GB
- 2x RJ45 GbE LAN, 4x PoE,
- 4x USB3.0, 6x COM, 8x DI & 8x DO
- 2x Removable HDD/SSD External Slot
- 1x PCIe Express, 1x Mini-PCIe , 1x M.2
- 2x RJ45 GbE LAN, 4x PoE,
- 4x USB3.0, 6x COM, 8x DI & 8x DO

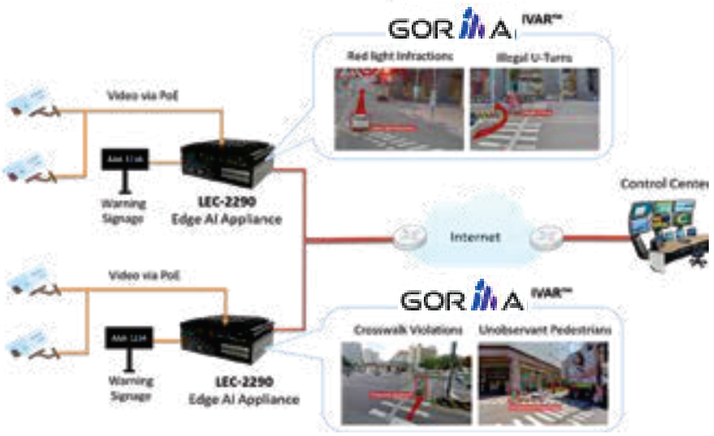


Intelligent Video Analytics

The collaboration between Lanner and Gorilla Technology aims to demonstrate edge AI video analytics solutions for various applications, including retail, transportation, and security. The video analytic solution, integrated and fully-tested on Lanner's LEC-2290H Edge AI appliance, comes preloaded with IVAR®, Gorilla's Intelligent Video Analytics Recorder, capable of processing multiple AI models of multiple-channel video analytics seamlessly. The analytics include behavior analytics, human intrusion detection, facial recognition, and vehicle analytics

LEC-2290H

- Pre-installed Falcon-H8 AI Accelerator
- Intel® Core™ i7-8700T/i7-8700
- 2x DDR4 2133/2400 SO-DIMM, Max. 32GB
- 2x RJ45 GbE LAN, 4x PoE,
- 4x USB3.0, 6x COM, 8x DI & 8x DO
- 2x Removable HDD/SSD External Slot
- 1x PCIe Express, 1x Mini-PCIe , 1x M.2

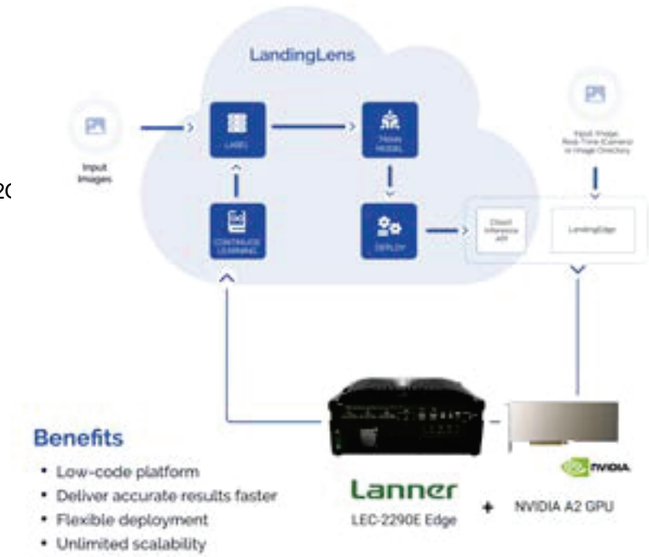


Computer Vision AI Solution

Lanner works with Landing AI to bring the deep learning-based visual inspection to all industries. Pre-validated with LandingLens, the world's leading Industrial AI Vision Inspection Platform, Lanner's Edge AI appliances can enable end-to-end, data-centric visual inspection with small dataset, changing environments and requirements. LandingLens makes deep learning deployment easier, faster, and more effective, helping to increase throughput, maintain product quality, and drive revenue.

LEC-2290E

- Pre-installed NVIDIA A2 GPU Card
- Intel® Core™ i7-8700T/i7-8700
- 2x DDR4 2133/2400 SO-DIMM, Max. 32(
- 2x RJ45 GbE LAN, 4x PoE,
- 4x USB3.0, 6x COM, 8x DI & 8x DO
- 2x Removable HDD/SSD External Slot
- 1x PCIe Express, 1x Mini-PCIe , 1x M.2

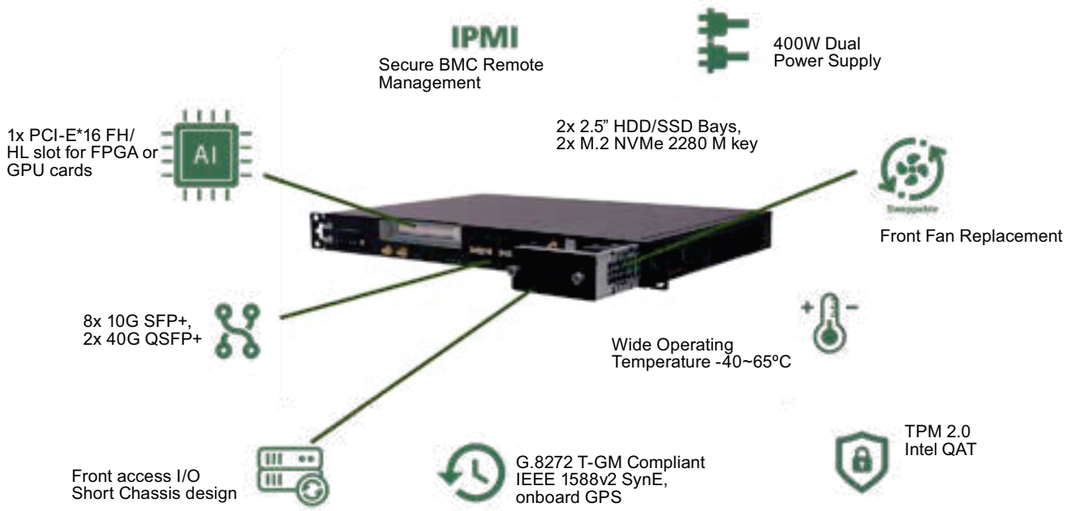


Real-time Traffic Video Analytics

Lanner collaborates with GoodVision to provide a complete solution that features Lanner rugged edge AI appliances and GoodVision AI engine. Compatible with existing IP camera, the real-time Traffic Video Analytics solution is designed for analyzing camera streams on the fly, providing traffic monitoring and real-time event detection on roads and junctions.

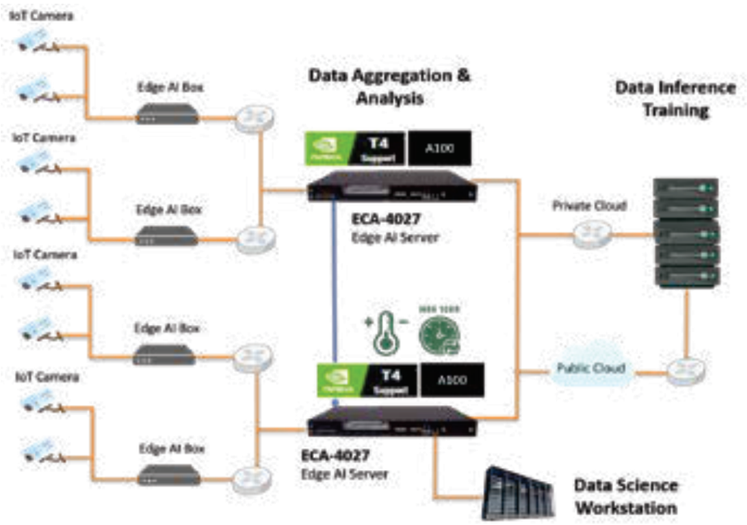
Edge AI Servers

Lanner provides server-grade Edge AI inference servers with multi-core processing, integrated BIOS security, GPU acceleration and scalability. Integrated with Intel Xeon CPU, massive storage and PCI-E expansion for GPU acceleration, these high-performance servers are designed for parallel processing power required in the most sophisticated AI machine vision and deep learning applications.



Protecting Critical Infrastructure Using Edge AI Platform

An Edge AI innovator in the U.S. approached Lanner seeking to establish cooperation by using their AI-enhanced software to work seamlessly with Lanner’s network edge servers.



Edge AI Server

	Intel Skylake D	Intel Skylake D	Intel Sapphire Rapids
Model Name	**ECA-4025**	**ECA-4027**	**ECA-5540** NEW
Processor System	Intel Xeon® D-2100 Processor (Skylake-D)	Intel Xeon® D-2100 Processor (Skylake-D)	4th Gen Intel® Xeon® Scalable Processor (Sapphire Rapids)
AI Acceleration Support	Accelerator cards with PCIe16 HHHL, M.2 & mPCIe FF	Accelerator cards with PCIe16 HHHL, M.2 & mPCIe FF	Accelerator cards with PCIe16 HHHL, M.2 & mPCIe FF
Fanless	N/A	N/A	N/A
Memory	64GB	64GB	1024GB
Storage	2 x 2.5” SATA, 2 x M.2 NVMe	2 x 2.5” SATA, 2 x M.2 NVMe	2 x 2.5” HDD/SSD 2 x M.2 NvME (PCIe) 2280 M key
Ethernet	1 x RJ45 and 8 x 10G SFP+	8 x 10G SFP+, 2x40G QSFP+	1x 1GbE Rj45 for MGMT
I/O	1 x USB 3.0	1 x USB 3.0	2 x USB 3.0
Expansion	1 x PCI-E*16	1 x PCI-E*16	1x FHFL (PCIex16, double width, 350W) 2xLP (PCIex8) or 1xFHHL (PCIex8), 1x OCP
Power	40~57 VDC	40~57 VDC	110 -240V
Mechanical	438 x 300 x 44 mm	438 x 371 x 44 mm	438x580x44 mm
Environment	-40~65°C	-20°C~45°C	SKU A: 0-40ºC SKU B:-5~50ºC
Driver Support	Linux	Linux	Linux
Certification	CE/FCC, Class A	CE/FCC, Class A	CE/FCC, Class A

Edge AI Server

	Intel Cascade Lake D	Intel Ice Lake D	Intel Sapphire Rapids
Model Name	**FX-3420**	**NCA-6520** NEW	**NCA-6530** NEW
Processor System	Intel® Xeon® Processor Scalable Family(Cascade Lake-SP)	Intel® Core™ i7-8700 (Codenamed Coffee Lake S)	4th Gen Intel® Xeon® Scalable Processor (Sapphire Rapids)
AI Acceleration Support	Accelerator cards with PCIe16 HHHL, M.2 & mPCIe FF	Accelerator cards with PCIe16 HHHL, M.2 & mPCIe FF	Accelerator cards with PCIe16 HHHL, M.2 & mPCIe FF
Fanless	N/A	N/A	N/A
Memory	768GB	32GB	1536GB
Storage	SATA: 12 x 3.5” HDD, 2 x 2.5”, 1 x M.2-22110	2x Swappable SATA III Drive	SKU A & C: 2 x 2.5” Swappable SKU B & D: 12 x 2.5” Swappable On-board: 3x M.2
Ethernet	4 x 10G SFP+, 6 x GbE RJ45	2x RJ45, 4x PoE	2 x GbE RJ45
I/O	2 x USB 2.0, 2 x USB 3.0	6x COM, 8x DIO, 4x USB 3.0	2x USB 3.0
Expansion	2x PCI-E*16, 1x PCI-E*8	1x PCIe*16, 1x Mini-PCIe, 1x B Key M.2	2x PCIE x16 FH/HL or 2x PCIE x16 FH/HL
Power	100V~240 V	9~30 VDC	100~240V
Mechanical	445 x 760 x 88 mm	275 x 115 x 225 mm	438 x 760x 88 mm
Environment	0°C~40°C	-20°C~45°C	0°C~40°C
Driver Support	Linux	Windows 10 IoT, Linux	Linux
Certification	CE/FCC, Class A	CE/FCC, Class A	CE/FCC, Class A

AI Acceleration Card

The most cost-efficient PCIe accelerator card on the market

Lanner's Falcon H8 modular, PCIe form factor provides an easily deployable solution for engineers looking to offload CPU loading for low-latency deep learning inference. With high-density AI processors, the Falcon H8 accommodates 1~6 Hailo-8™ AI processors, offering a modular, cost-effective Edge AI solution with high processing capabilities and power efficiency. .

Through a standard PCIe interface, the Falcon H8 AI Accelerator Card enables legacy devices such as NVRs, Edge AI boxes, Industrial PCs and robots to run video-intensive, mission-critical Edge AI applications such as video analytics, traffic management, access control, and beyond.

Specifications

AI Performance

Up To 156 TOPs 8000 FPS Of ResNet-50, 1300 FPS Of YOLOv5m

AI Processors

1/2/4/6 Hailo-8™ AI Processors with Hailo Patented Structure Defined Dataflow Architecture

AI Frameworks Support

Hailo AI Dataflow Compiler With Profiler And Emulator Supports TensorFlow, ONNX And PyTorch Frameworks

PCIexpress Interface

PCI Express x16 Compliant With PCI Express Specification v3.0

System Compatibility

Intel x86 or ARM Devices, Linux OS e.g., Ubuntu, Yocto
Lanner Network and Edge AI Appliances

Power Consumption

Typical: 35W

Temperature

Operating: 0~70ºC (Commercial Grade)
-40~85ºC (Industrial Grade)
Storage: -40~85ºC

Humidity

5% - 90% RH, Non-condensing

Dimension

Standard PCIe Single Slot Form-factor
167.65mm x 111.15mm Without Bracket

Certifications

CE Class A, FCC Class A

Supported Devices

- NVRs & Edge AI Boxes
- Industrial Gateways & PCs
- Industrial Robots

Ordering Information

Falcon H8

FALCON-H8A	IEK-AI0001A, Commercial Grade, 6x Hailo-8™ AI Processor
FALCON-H8B	IEK-AI0001B, Commercial Grade, 5x Hailo-8™ AI Processor
FALCON-H8C	IEK-AI0001C, Commercial Grade, 4x Hailo-8™ AI Processor
FALCON-H8D	IEK-AI0001D, Industrial Grade, 6x Hailo-8™ AI Processor
FALCON-H8E	IEK-AI0001E, Industrial Grade, 5x Hailo-8™ AI Processor
FALCON-H8F	IEK-AI0001F, Industrial Grade, 4x Hailo-8™ AI Processor

Falcon Lite

Model No.	Rev.A1	
Falcon H8L16A	2x Hailo 8 NPU	Commercial-grade
Falcon H8L16D	4x Hailo 8 NPU	Commercial-grade
Falcon H8L16E	2x Hailo 8 NPU	Industrial-grade
Falcon H8L16H	4x Hailo 8 NPU	Industrial-grade
Falcon H8L8A	2x Hailo 8 NPU	Commercial-grade
Falcon H8L8D	4x Hailo 8 NPU	Commercial-grade
Falcon H8L8EE	2x Hailo 8 NPU	Industrial-grade
Falcon H8L8H	4x Hailo 8 NPU	Industrial-grade
Falcon H8L4A	1x Hailo 8 NPU	Commercial-grade
Falcon H8L4B	2x Hailo 8 NPU	Commercial-grade
Falcon H8L4E	1x Hailo 8 NPU	Industrial-grade
Falcon H8L4F	2x Hailo 8 NPU	Industrial-grade

Feature Highlights

High Processing Power
Up to 156 TOPS
8000FPS of ResNet-50

High Efficiency
Typical Power Consumption 35W

Cost-effective
Lowest TOPs/$

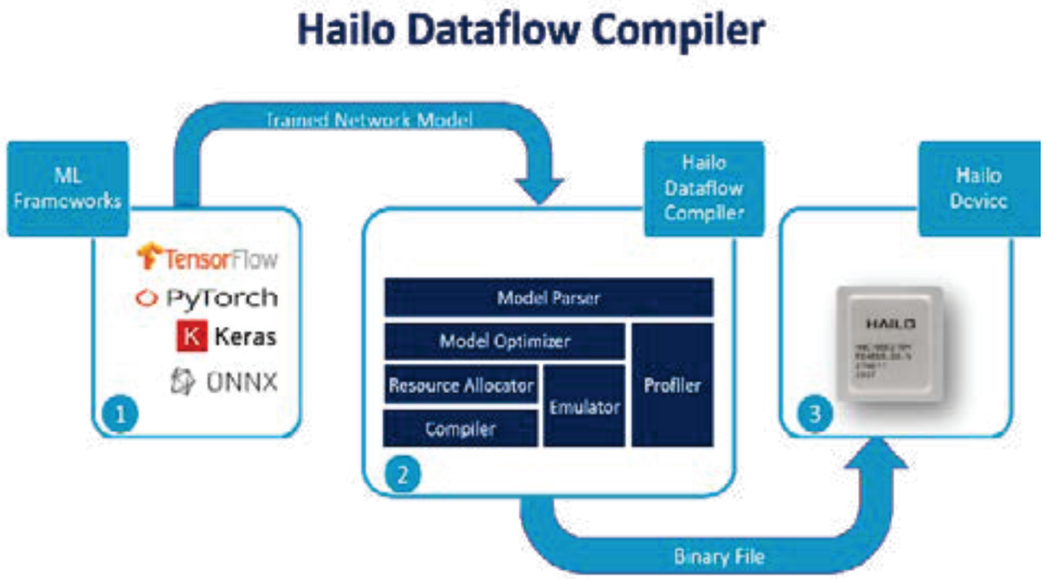
Advanced AI Applications
Supports state-of-the-art
NN model in high resolution

Various DL Architectures
Hailo Model Zoo
Hailo TAPAAS AI Applications

Ease of HW & SW integration
Hailo AI Dataflow Compiler
Standard PCIe single slot form-factor

Hailo Toolchain and Developer Tools

The Hailo Dataflow Compiler API seamlessly integrates with existing deep learning development frameworks to allow smooth and easy integration in existing development ecosystems. Hailo Dataflow Compiler is used for compiling users' models to Hailo binaries. The input of the Dataflow Compiler is a trained Deep Learning model. The output is a binary file which is loaded to the Hailo device. The HailoRT API is used fo deploying the built model on the target device. This library is used by the runtime applications.



ناوک هوشمند پویان

Edge Intelligent Enterprise

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